

REMARKS

Responsive to the Office Action dated July 13, 2004, claims 28-30 have been canceled. Upon entry of this amendment, claims 15-27 will be pending in the present application.

Claims 15-27 have been rejected under 35 U.S.C. §103(a) as being obvious over a combination of U.S. Patent no. 298,111 (Morse), in view of U.S. Patent no. 1,324,789 (Bey). This rejection is respectfully traversed and reconsideration is requested for the reasons that follow.

Claims 15-27 relate to a special design for a billiard cue wherein substantially more than half of the weight of the billiard cue is located in the distal half of the cue, i.e. the half of the cue closest to the tip of the cue used to strike the ball. The advantage of this cue design is substantial since it increases the amount of force applied to the ball when struck by the cue at a constant acceleration, relative to a conventional cue. This results from the fact that a larger portion of the mass of the cue is located closer to the tip.

The force exerted by the tip of the cue on the ball is defined by $F = (\text{effective mass of the cue tip}) * (\text{acceleration of the cue tip})$. Since the cue is generally in contact with the ball for about 0.001 second, there is insufficient time for the force of the entire mass of the cue to be transferred to the ball. This is because the distance that the force has to be transferred from the butt end of the cue to the ball is such that there is insufficient time to transfer the force of the mass of the cue at the butt end all the way to the tip during the 0.001 second contact time between the cue tip and the ball. As a result, generally the mass of the cue located in the proximal half of the cue does not transfer to the ball during the impact of the cue and the ball. As a result, placement of additional weight in the proximal half of the cue would not be expected to exert a substantial influence on the amount of force transferred to the ball by the cue tip.

The cue of the present invention places more weight in the distal half of the cue where the weight can effectively be transferred to the ball during the 0.001 second contact time between the cue tip and the ball. As a result, the same amount of force can be exerted on the ball by the cue tip using the cue of the present invention using less acceleration of the cue tip, as compared to conventional cues, since more of the mass of the cue is transferred to the ball as a result of placement of the mass close enough to the cue tip to allow the transfer of the mass to the ball during the 0.001 second contact time between the cue tip and the ball. This means that the player can employ a gentler stroke to apply the same amount of force to the ball using the cue of the

present invention, as compared to a conventional cue, thereby reducing the chance for miscues and variations in the stroke causing inaccurate shots. The cue of the present invention goes against conventional wisdom, which is to place as much of the weight of the cue as possible in the butt end of the cue stick, far away from the tip of the cue.

With the foregoing discussion in mind, it should be noted that Morse is an example of a conventional cue, i.e. a cue where substantially more than half of the mass of the cue is located in the proximal half of the cue. This can be seen, for example, from Fig 1 which shows that the cue of Morse is wider at the proximal, butt end (sections A-B) than at the distal end (Sections C-E).

Morse contemplates changing the balance of the billiard cue and increasing or decreasing the weight of the cue. Page 1, lines 72-73 of Morse. Morse employs two types of weights, heavy weights *h*, and light weights *i*. Page 1, lines 74-90 of Morse. Morse does not mention in the text where the weights *h*, *i* are to be located in cue, but rather discloses this only in the drawings. Specifically, it can be seen from Figs. 3-4 and 6 of Morse that Morse only contemplates inclusion of weights *h*, *i* in the proximal sections A, B of the cue since no weights are shown in any other sections of the cue in any of the drawings. In addition, in the sole cross-sectional view of sections D-E of the cue (Fig. 5), no pockets are shown to receive weights, as is the case for sections A-B of the cue. This is consistent with conventional thinking that the weight of the cue should be placed at the proximal, butt end of the cue.

Accordingly, since the distal section of the cue of Morse is formed by the smaller diameter sections C-E, then it will have less weight than the proximal section of the cue of Morse which is formed by the larger diameter sections A-B. Weights can be added to the proximal section of the cue formed by the larger diameter sections A-B, but this will only increase the amount of weight in the proximal section of the cue of Morse leading the skilled person away from the present invention. Therefore, Morse clearly does not teach or suggest to the skilled person to locate substantially more than half of the weight of a billiard cue in the distal half of the cue, as is required by all of claims 15-27 of the present application.

The secondary reference to Bey does not cure the deficiency of Morse since Bey does not contain any teaching, suggestion or motivation to locate substantially more than half of the weight of the cue in the distal half of the cue, as is required by claims 15-27 of the present application.

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Accordingly, since both Morse and Bey lack any teaching or suggestion of a necessary element of claims 15-27 of the present application, the Examiner has not made out a case of *prima facie* obviousness. Therefore, withdrawal of the rejection of claims 15-27 over Morse in view of Bey is requested.

Claims 28 and 30 have been rejected under 35 U.S.C. §102 over U.S. patent no. 291,703 (Easthope et al.) and claim 29 has been rejected under 35 U.S.C. §103(a) as obvious over Easthope et al. Claims 28-30 have been canceled without prejudice to resubmission, thereby obviating this rejection.

Favorable consideration and issuance of a Notice of Allowance is requested.

Please charge any additional fee that may be associated with this paper and/or credit any overpayment to Deposit Account No. 50-0462.

Respectfully submitted,

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